



# Quantified Self: Self Tracking for Health

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[www.medando.de](http://www.medando.de)

# Introduction

Scientist,  
Head of department



Deutsches Zentrum  
für Luft- und Raumfahrt  
German Aerospace Center

Co-Founder, CEO



**medando**

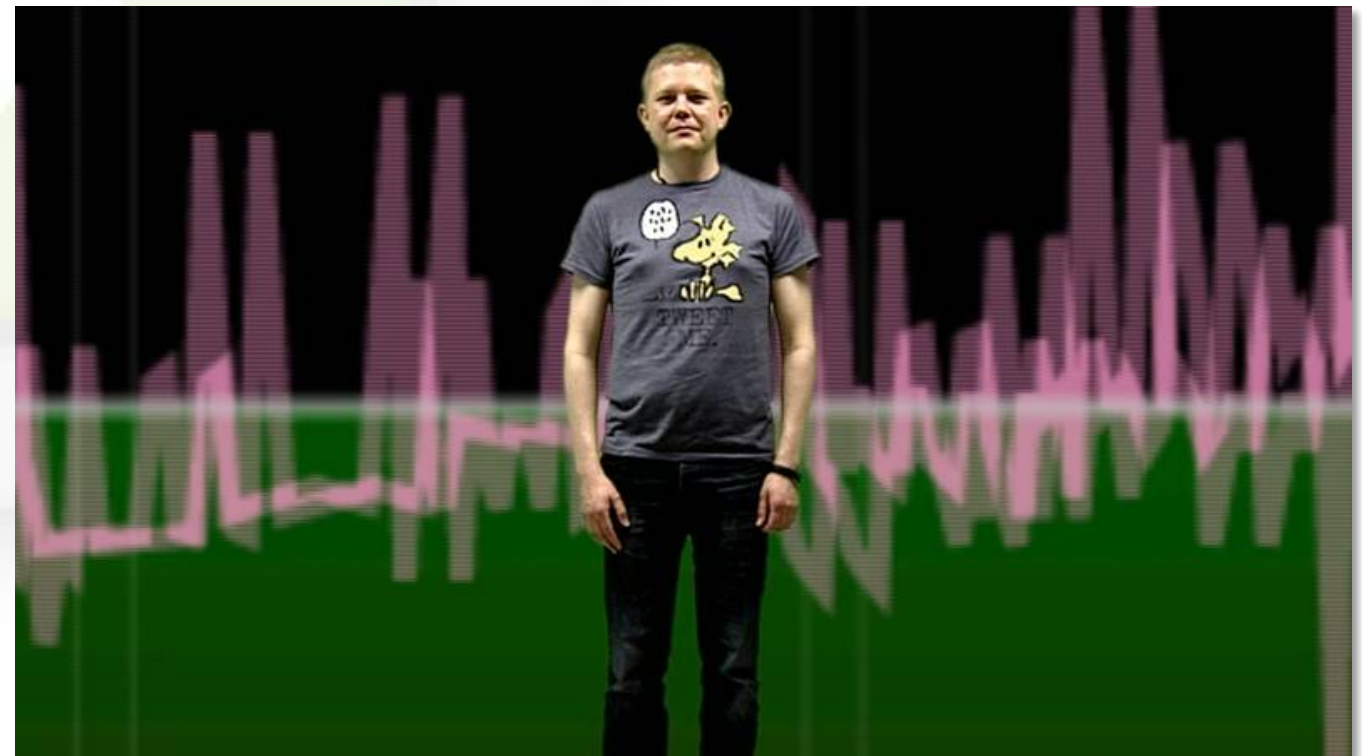
Co-Founder



Quantified Self  
Meetup Cologne

## Quantified Self – track myself

- With sensors
- With smartphone apps



# Quantified Self



Quantified Self  
self knowledge through numbers

# What is Quantified Self?

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## Self-knowledge through numbers

- Analyze trends and set goals to improve yourself

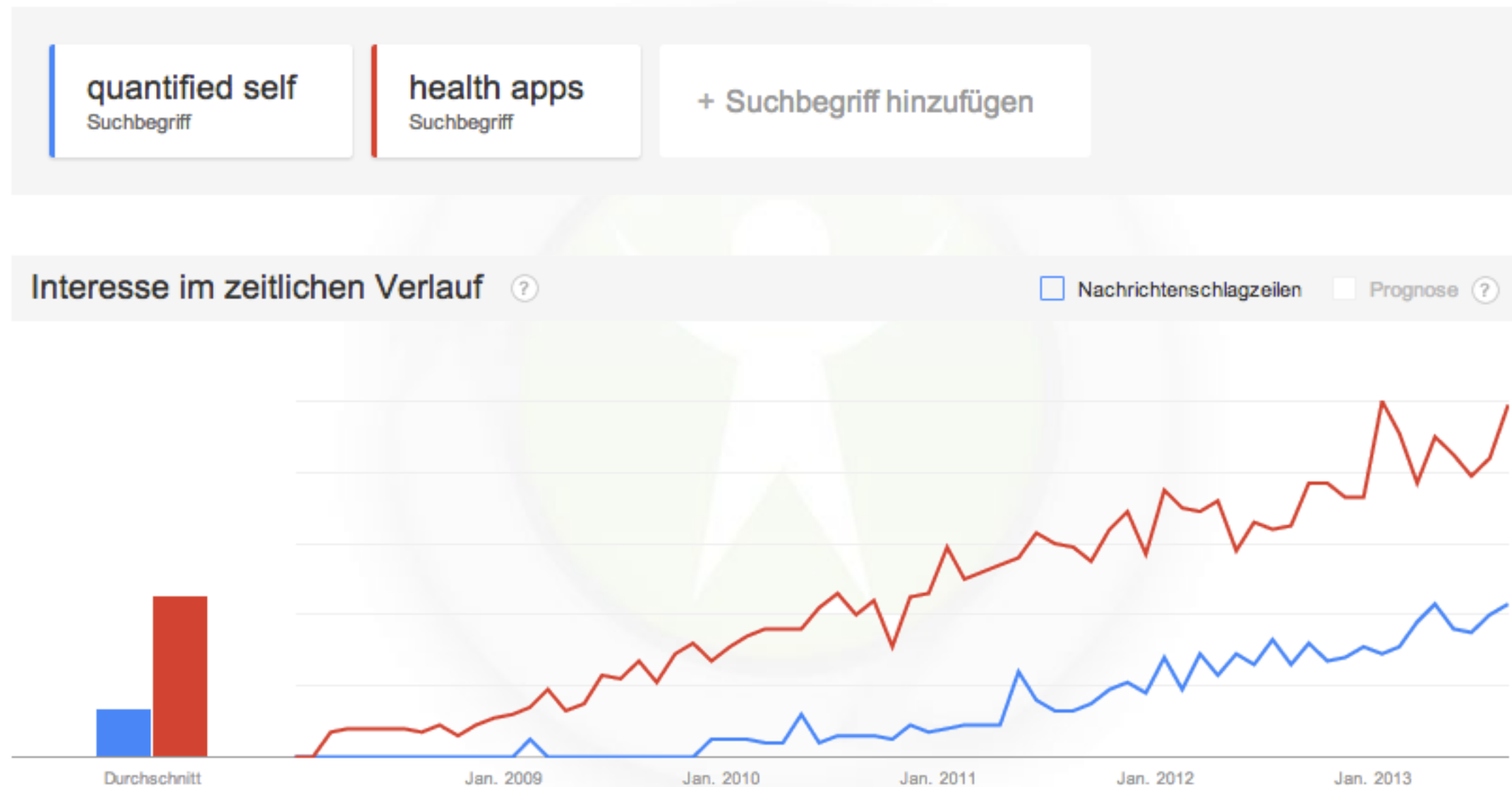
## Recording of daily activities

- Fitness, sleep, location, ...
- Monitoring and display of information from various devices, services, and applications

- **Self Tracking**
- **Life Hacking**
- **Life Logging**
- ...



# Google Trends: “Quantified Self” & “Health Apps”



# Quantified Self Meetups

## Quantified Self Meetup Groups



**Groups**  
**149**

**Members**  
**26,413**

**Interested**  
**7,011**

**Cities**  
**113**

**Countries**  
**35**



# Objects of Tracking: Health-oriented

## Well-being-oriented

- Body
- Mood
- Addictions
- Physical activities
- Nutrition
- Other

## Directly health-oriented

- Chronic diseases
- No-chronic diseases
- General medication
- Symptoms
- Blood test results
- Insulin intake
- Blood sugar
- General daily records about health state

# Objects of Tracking: Not-health-oriented

## Environmental

- Temperature
- Ozone concentration
- Atmospheric pressure
- Location
- Rain
- Clouds

## Relationships

- Frequency
- Quality
- Sex

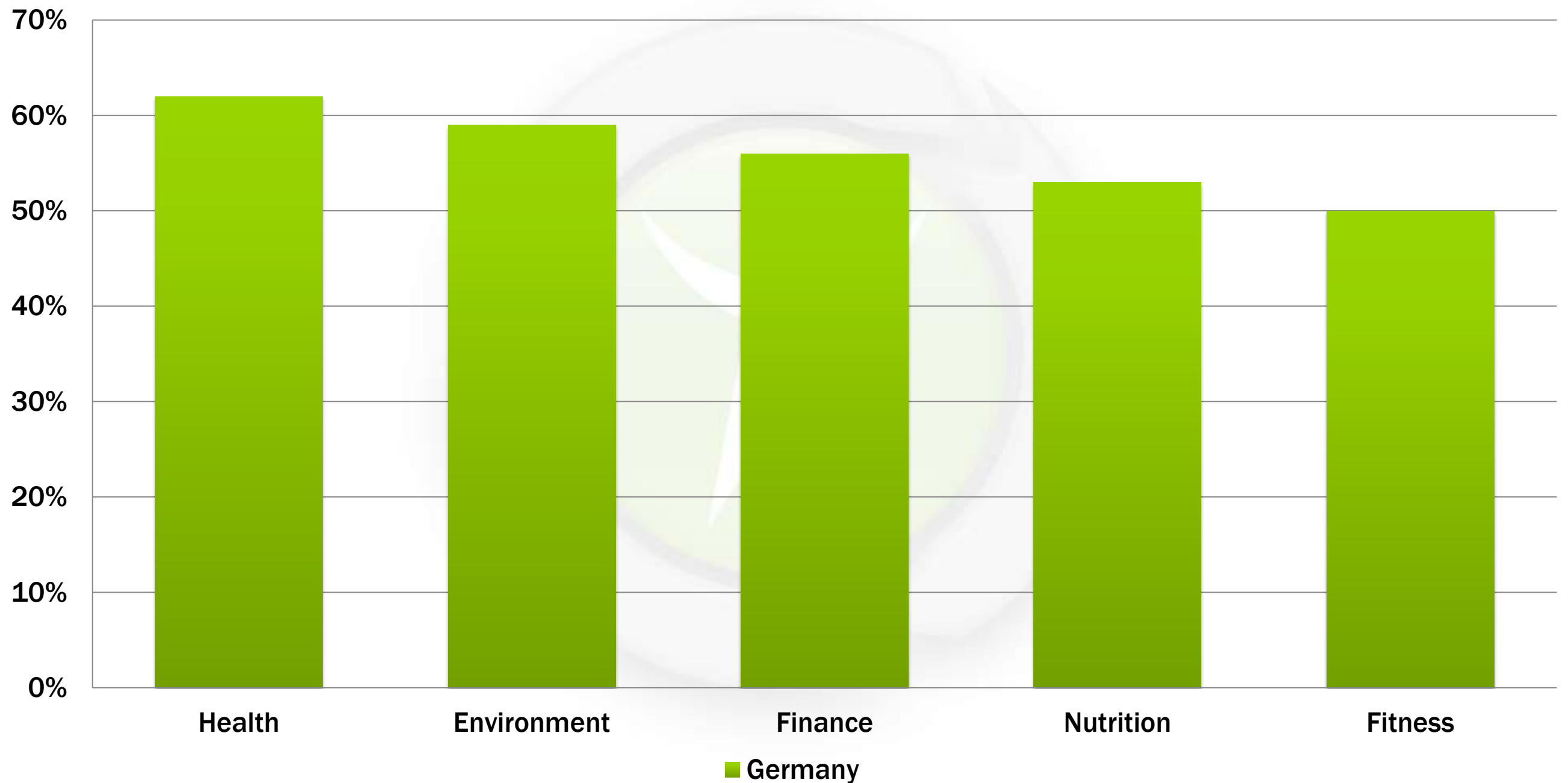
## Other

- Finance
- ToDos
- Delays (Train, etc.)



# Motivation

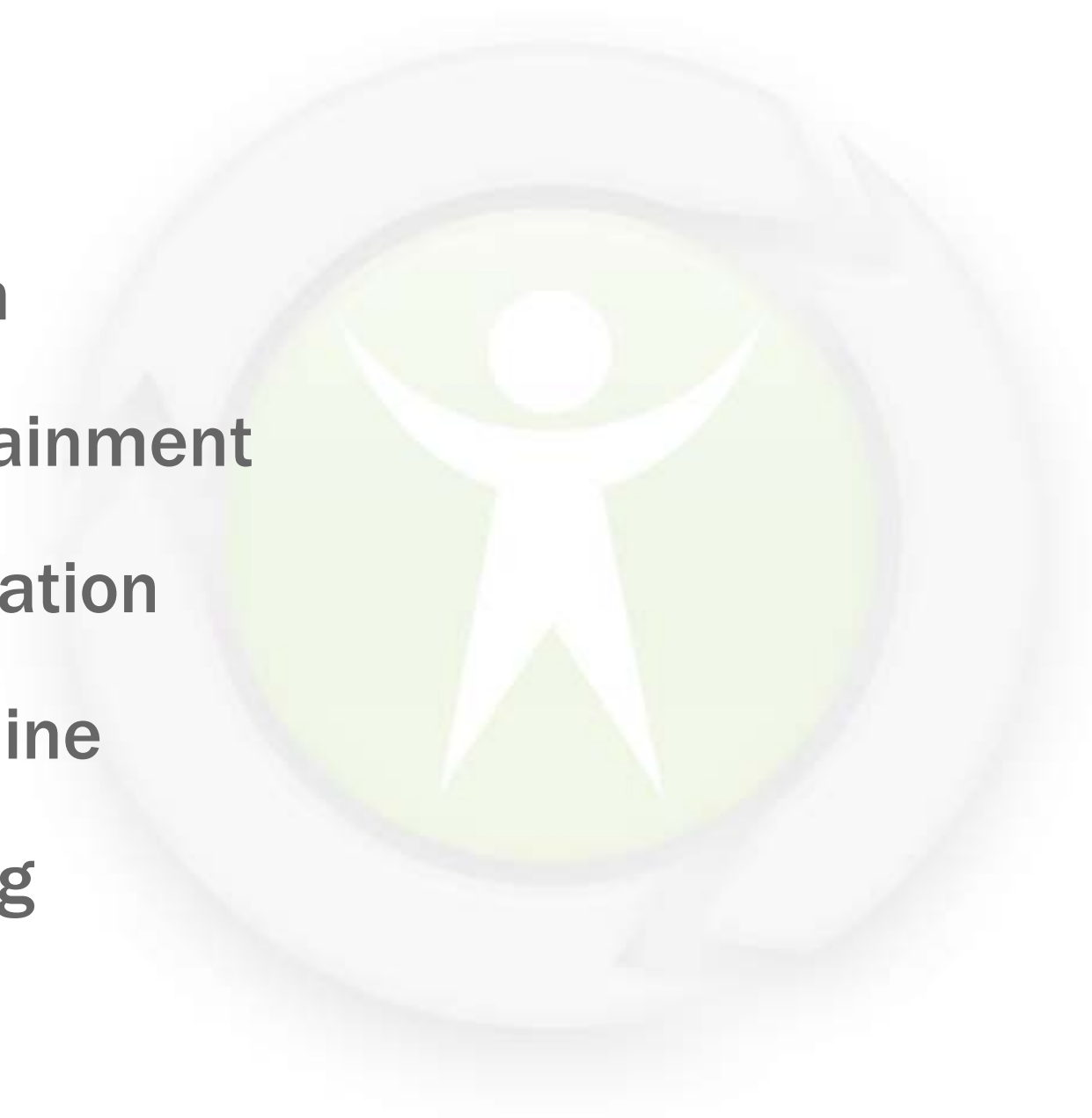
# What People are Tracking?



Studie QlikTech, August 2013

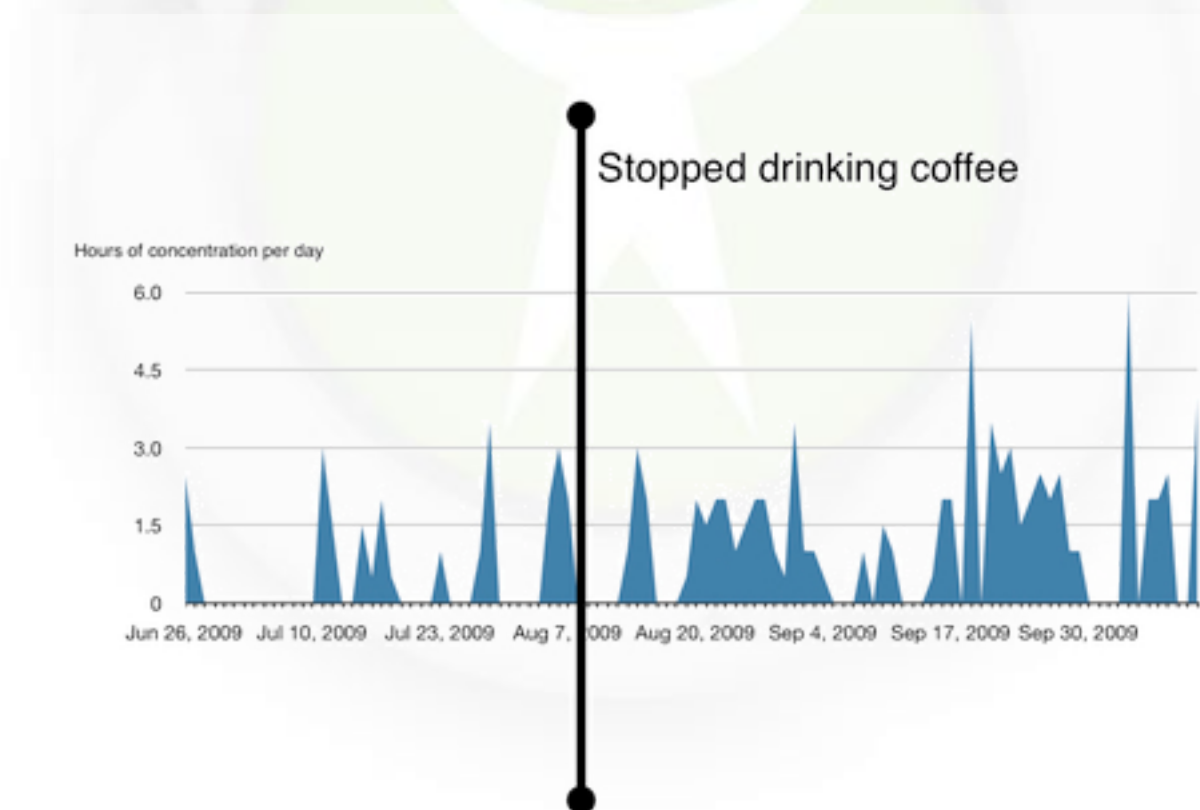
## Five motivations

- **Self-Design**
- **Self-Entertainment**
- **Self-Association**
- **Self-Discipline**
- **Self-Healing**



## Self-Design

- motivated by the possibilities of self-optimization



# Motivation *Self-Entertainment*

## Self-Entertainment

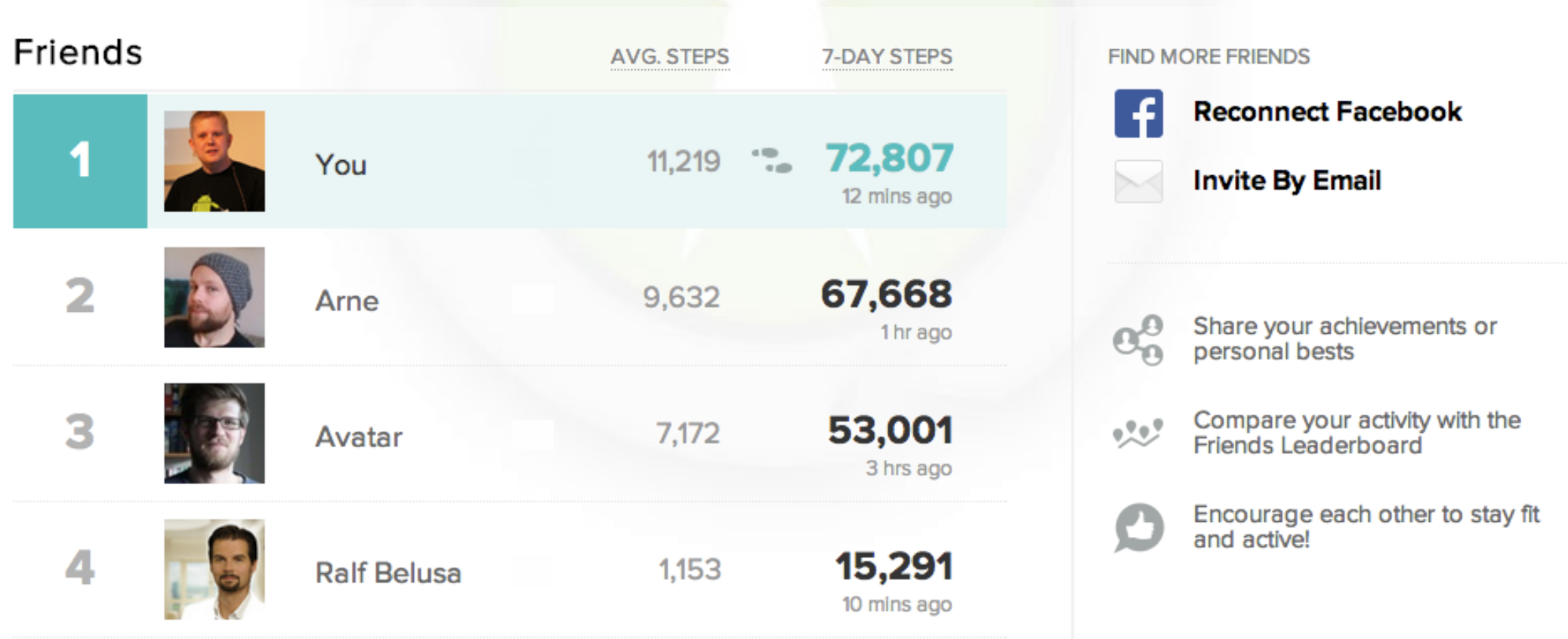
- motivated due to the “pleasure-bringing” aspects of self-tracking



# Motivation *Self-Association*

## Self-Association

- motivated by the prospect of community citizenship and self-individualizing aspects within a community

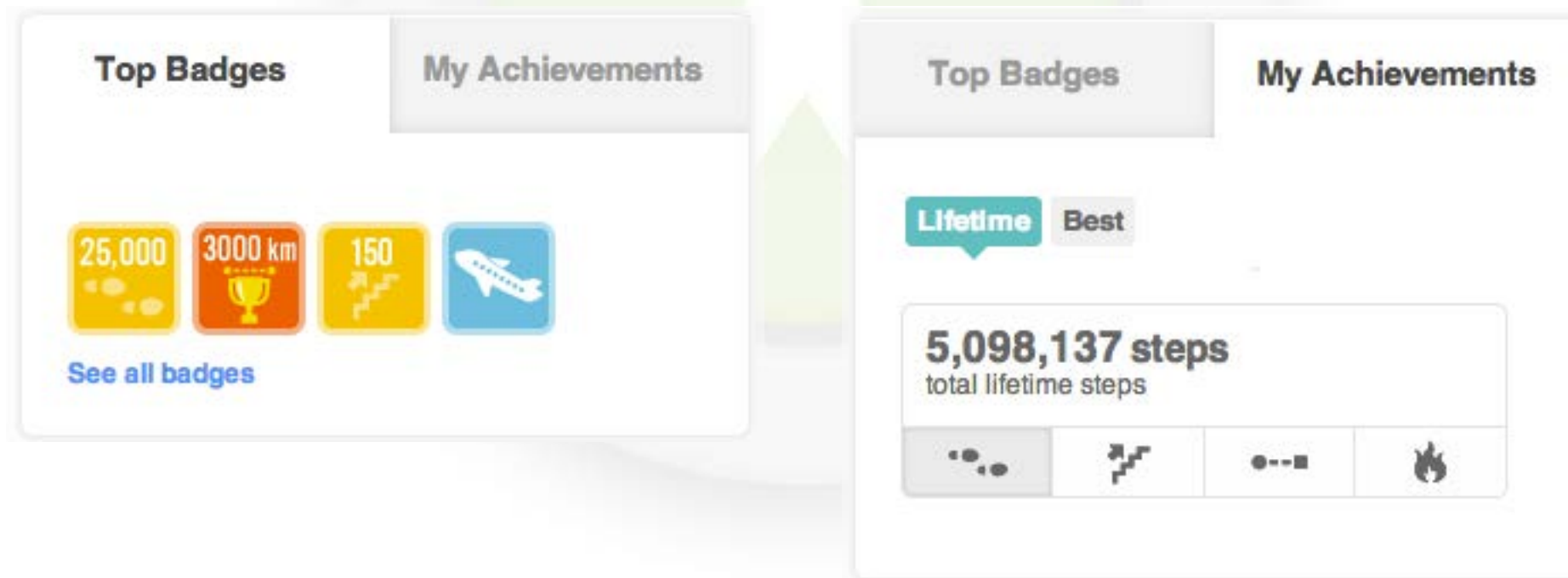




# Motivation *Self-Discipline*

## Self-Discipline

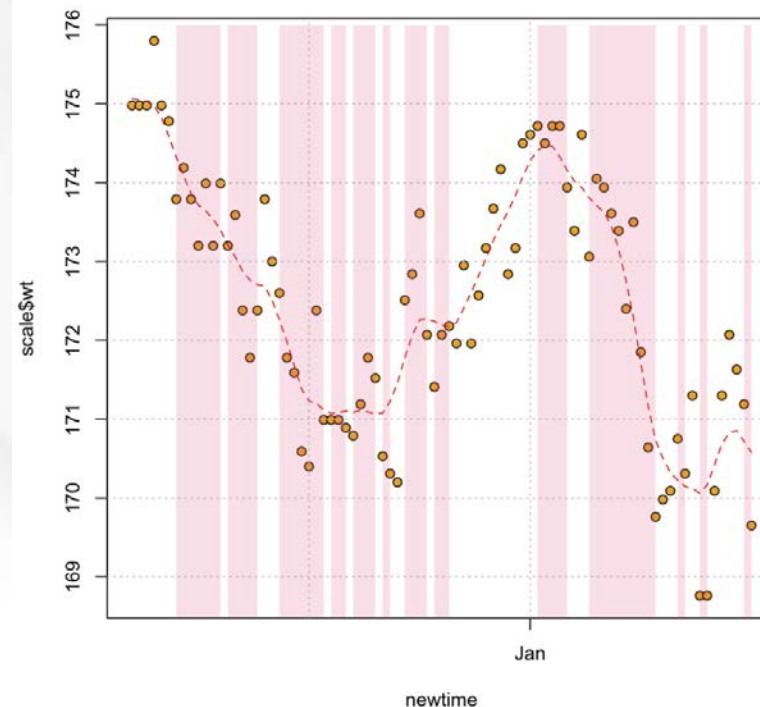
- motivated due to the self-gratification possibilities of self-tracking



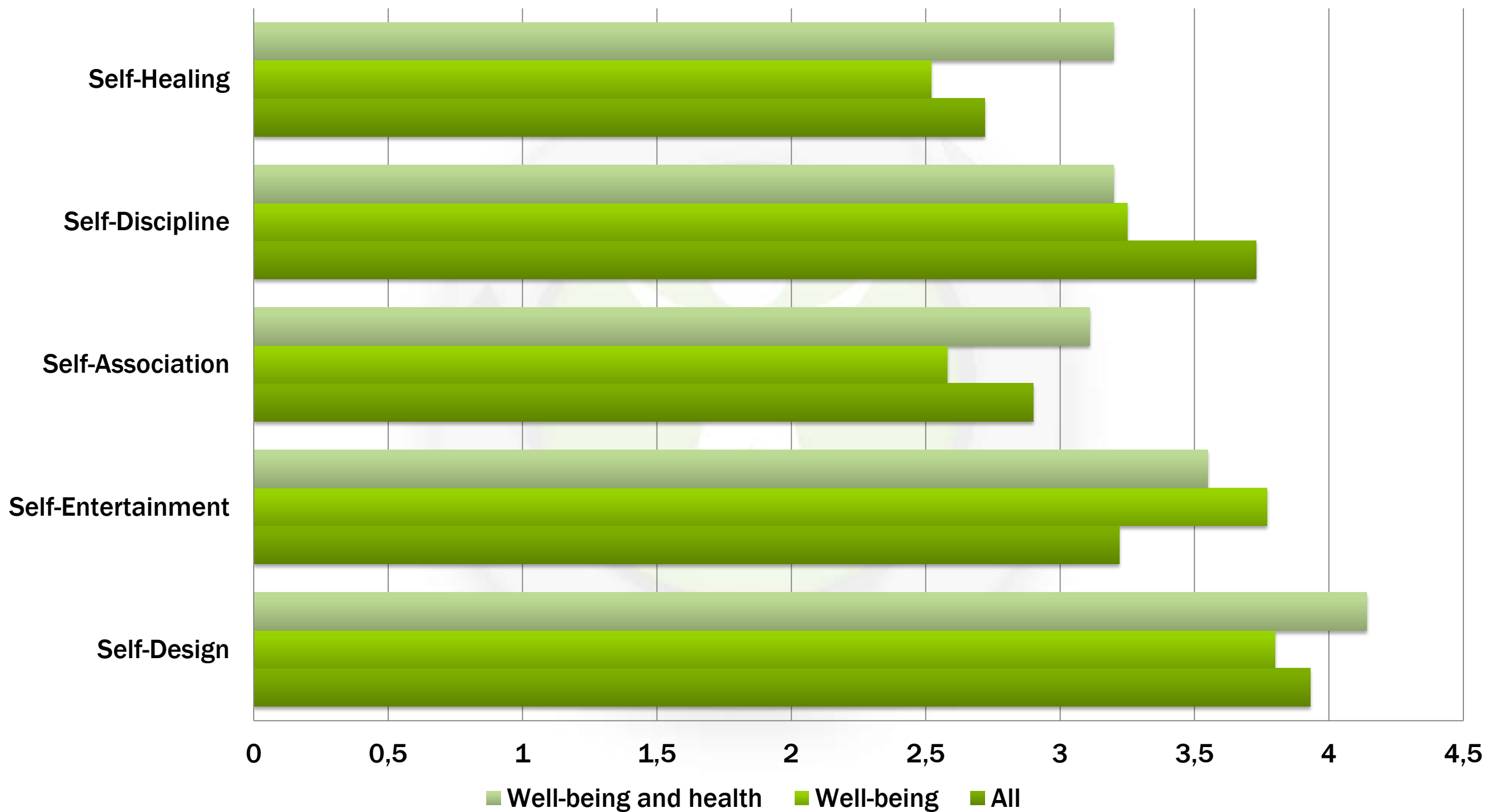
# Motivation *Self-Healing*

## Self-Healing

- motivated by the self-healing possibilities of self-tracking

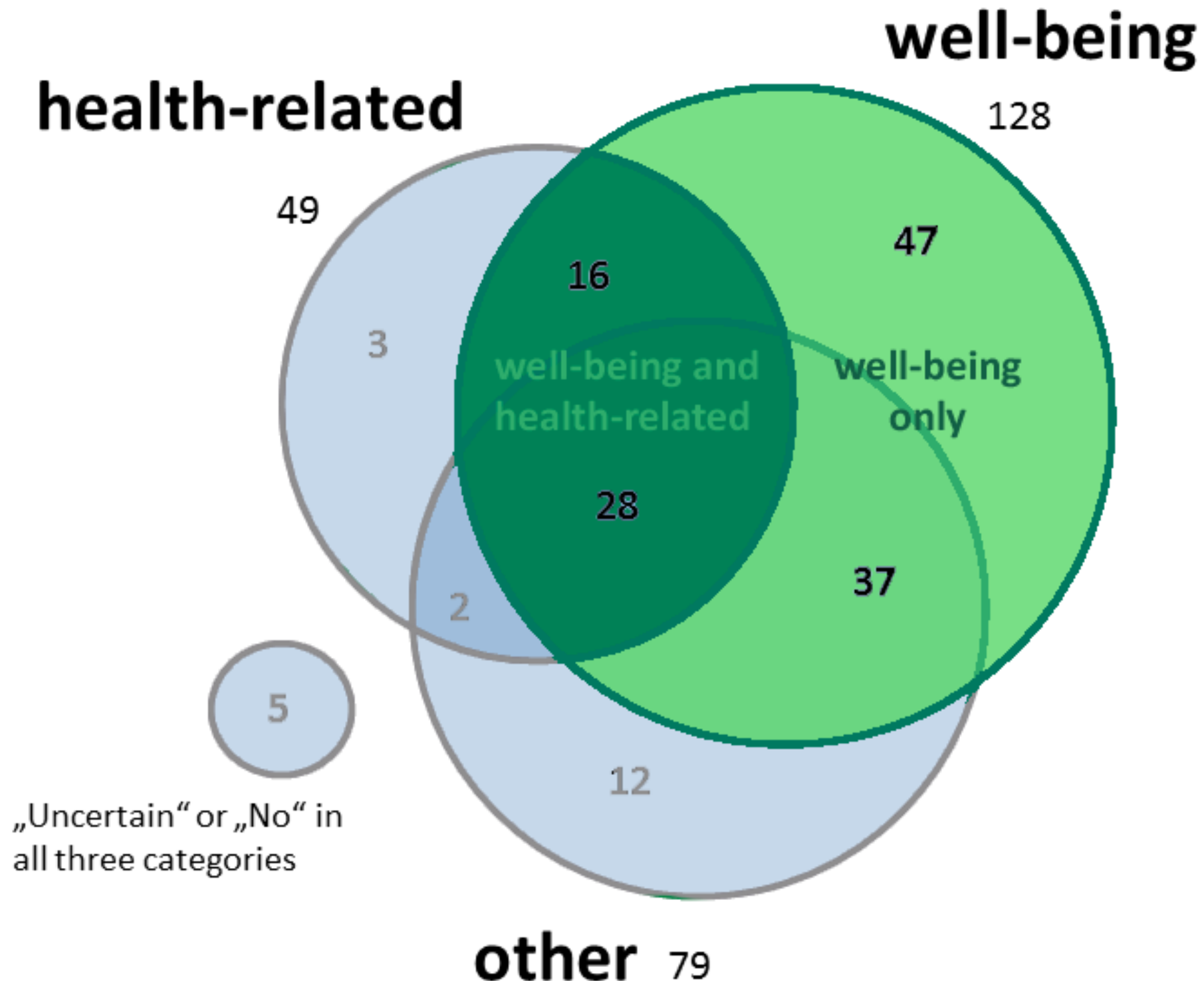


# Mean Motivation (Range 1- 5)



Source: Marcia Nißen, Quantified Self – An Exploratory Study on the Profiles and Motivations of Self-Tracking, Bachelor Thesis (2013)

# Self-Assessment of Self-Tracking Categories



Source: Marcia Nißen, Quantified Self – An Exploratory Study on the Profiles and Motivations of Self-Tracking, Bachelor Thesis (2013)

# Self Experiments



## JOIN AN EXPERIMENT

### The Time of Day Experiment

What sorts of tasks do you perform best at different times of day?

[Find out now](#)

### The Breakfast Experiment

How does eating breakfast affect your mind for the remainder of the day?

[Find out now](#)

### The Coffee Experiment

How does coffee affects your reaction time, problem solving, and more?

[Find out now](#)

### The Sex Experiment

Does Sex increase or decrease your mental productivity?

[Find out now](#)

### The Meditation Experiment

Does Meditation improve or harm your cognitive abilities?

[Find out now](#)

### Create your own experiment

Create your own experiment to test the effects of exercise, food, or anything else.

[Get started](#)

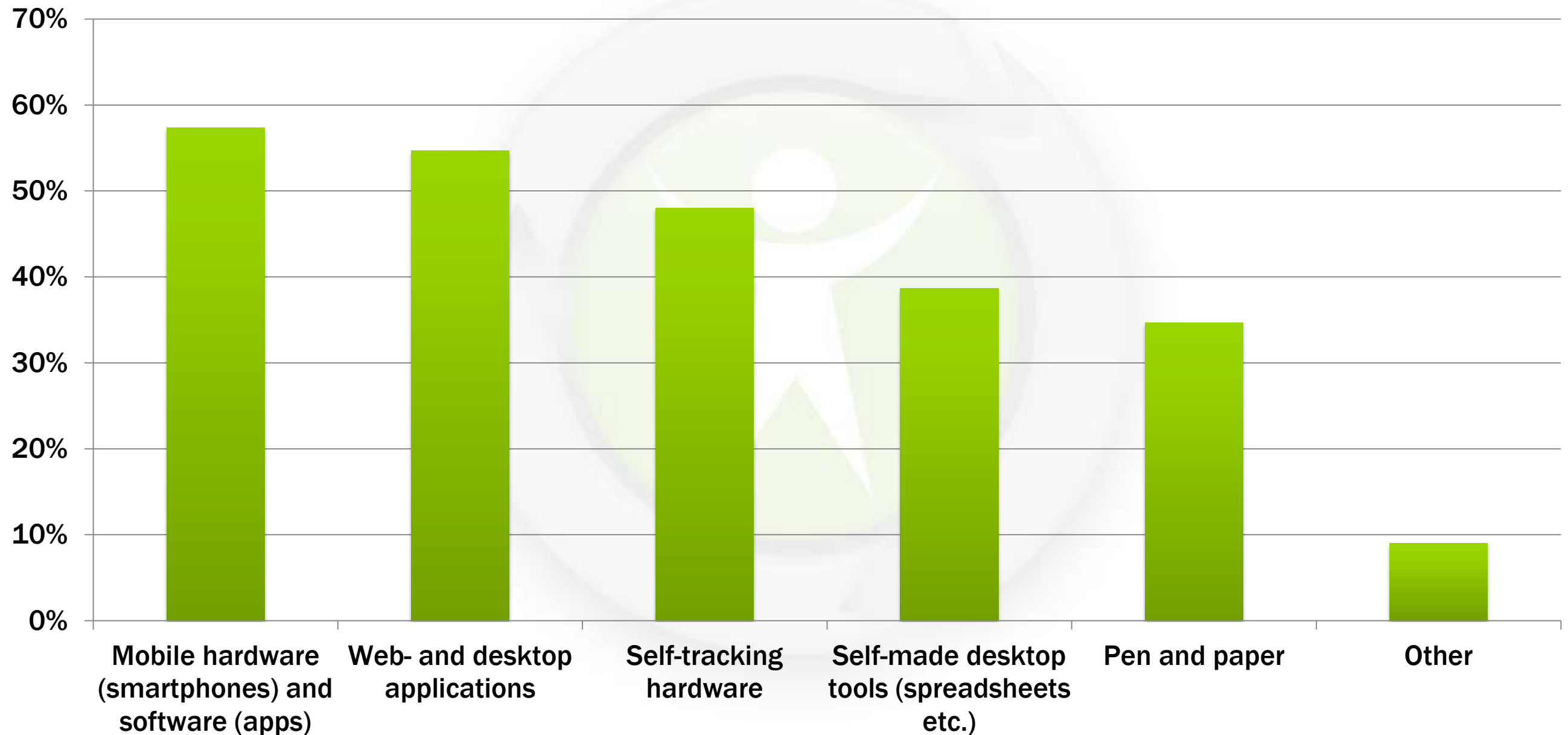
Design experiments – Measure results – Improve yourself



# Wearable Sensors, Devices, and Apps

# Technologies for Self-Tracking

**Deployed technologies for self-tracking**



Source: Marcia Nißen, Quantified Self – An Exploratory Study on the Profiles and Motivations of Self-Tracking, Bachelor Thesis (2013)



# Steps





# Activity

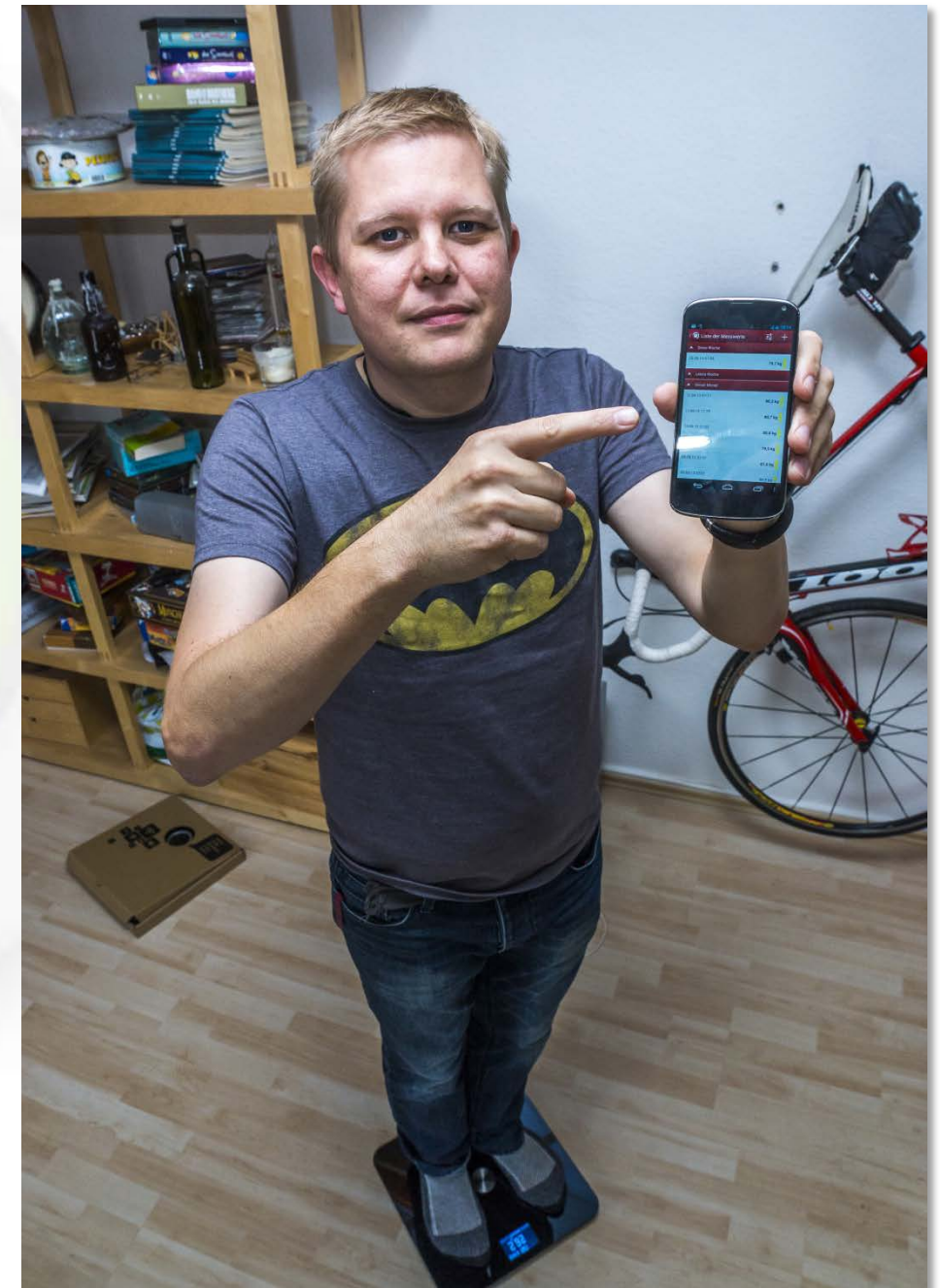




# Blood Pressure



# Weight



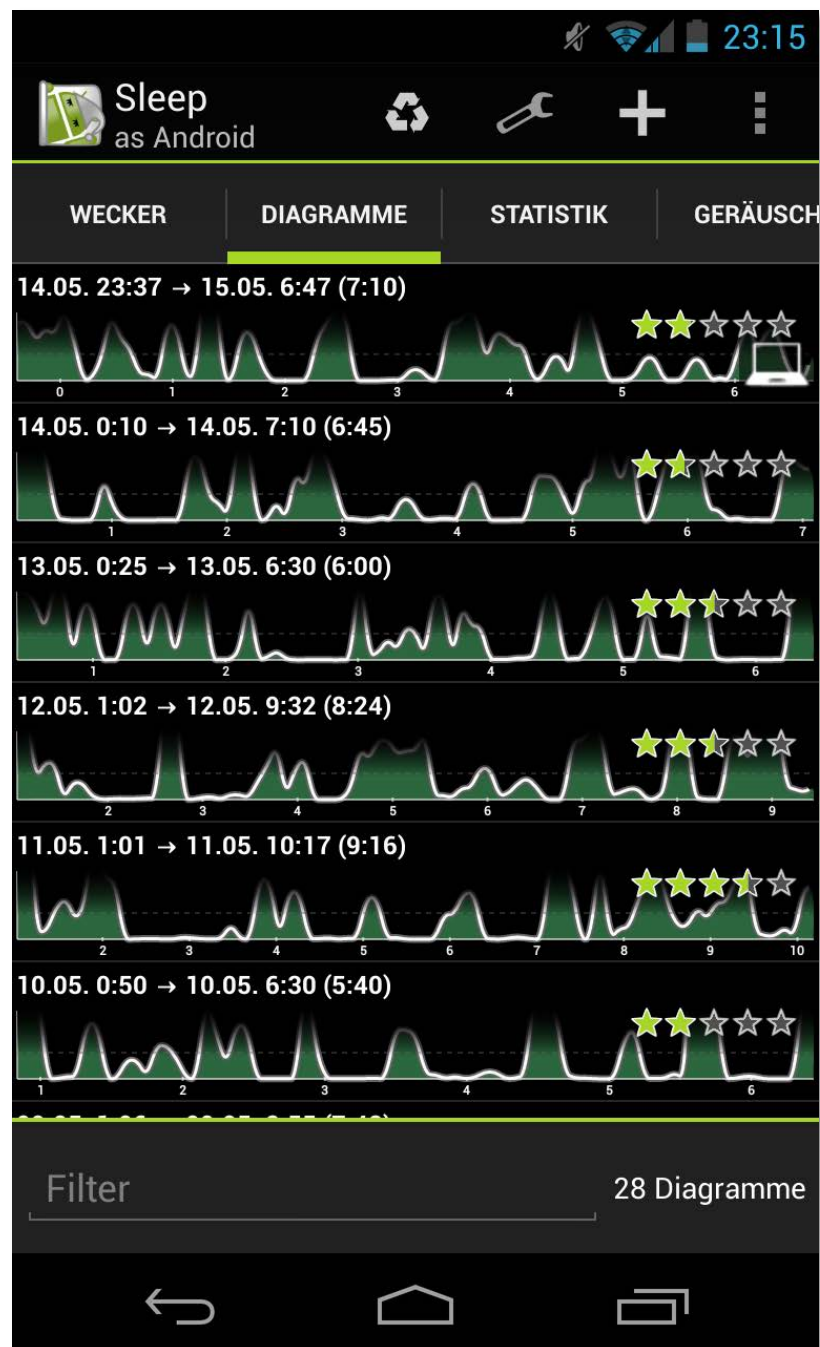


# Stress

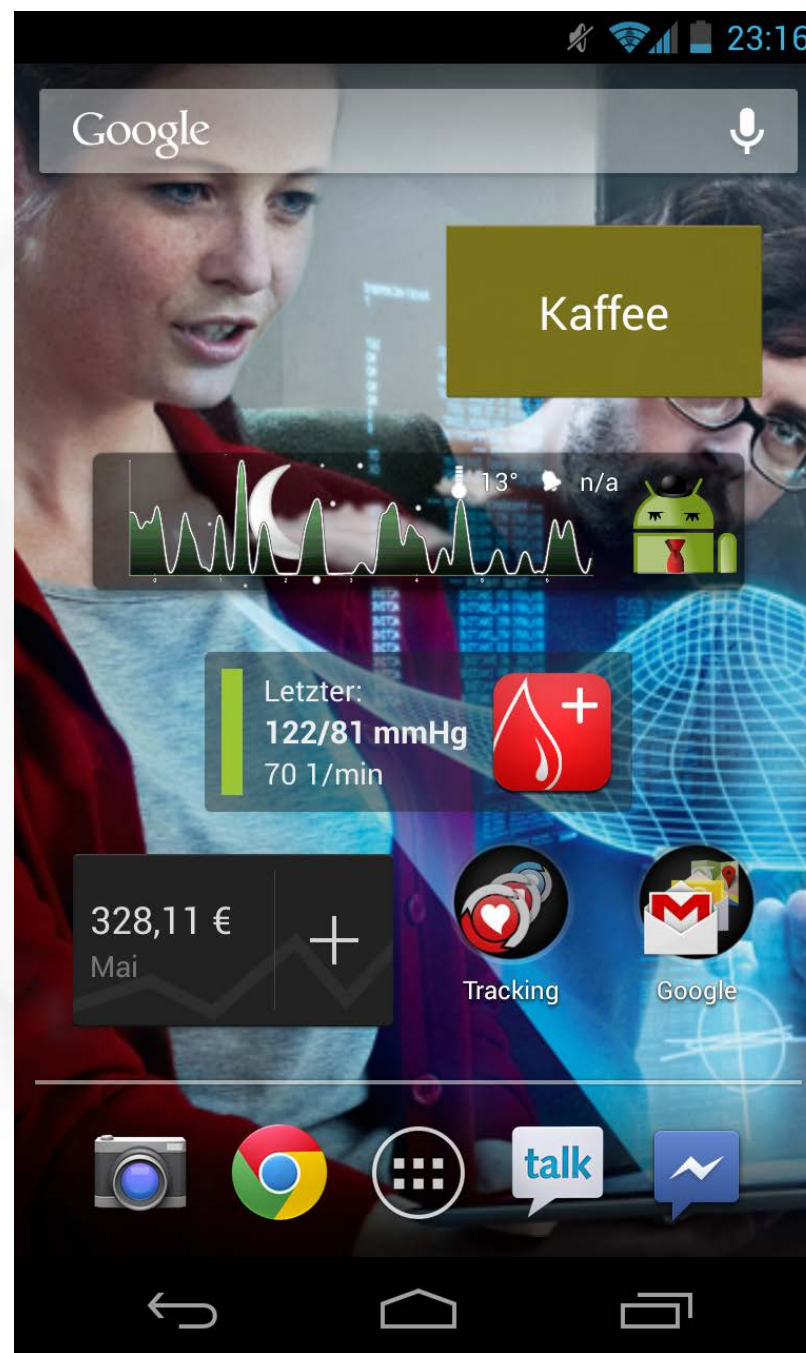




# Sleep



# Coffee, Medication, Expenses, ...



# Medando: *BloodpressureCompanion*

10:03

Add measurement

Systolic: 120

Diastolic: 82

Pulse: 62

Add

Details

10:08

Measurement list

Current week

10/12/12 11:39 PM	134/83 mmHg	
Abends Tabletten...	48 bpm	
10/12/12 4:36 PM	133/78 mmHg	
Eine Flasche Club-Ma...	51 bpm	
10/9/12 10:40 PM	110/72 mmHg	
-	65 bpm	
10/7/12 9:50 PM	109/72 mmHg	
Am Rechner arbeiten.	61 bpm	
10/7/12 9:31 AM	128/82 mmHg	
Tabletten noch nicht...	53 bpm	

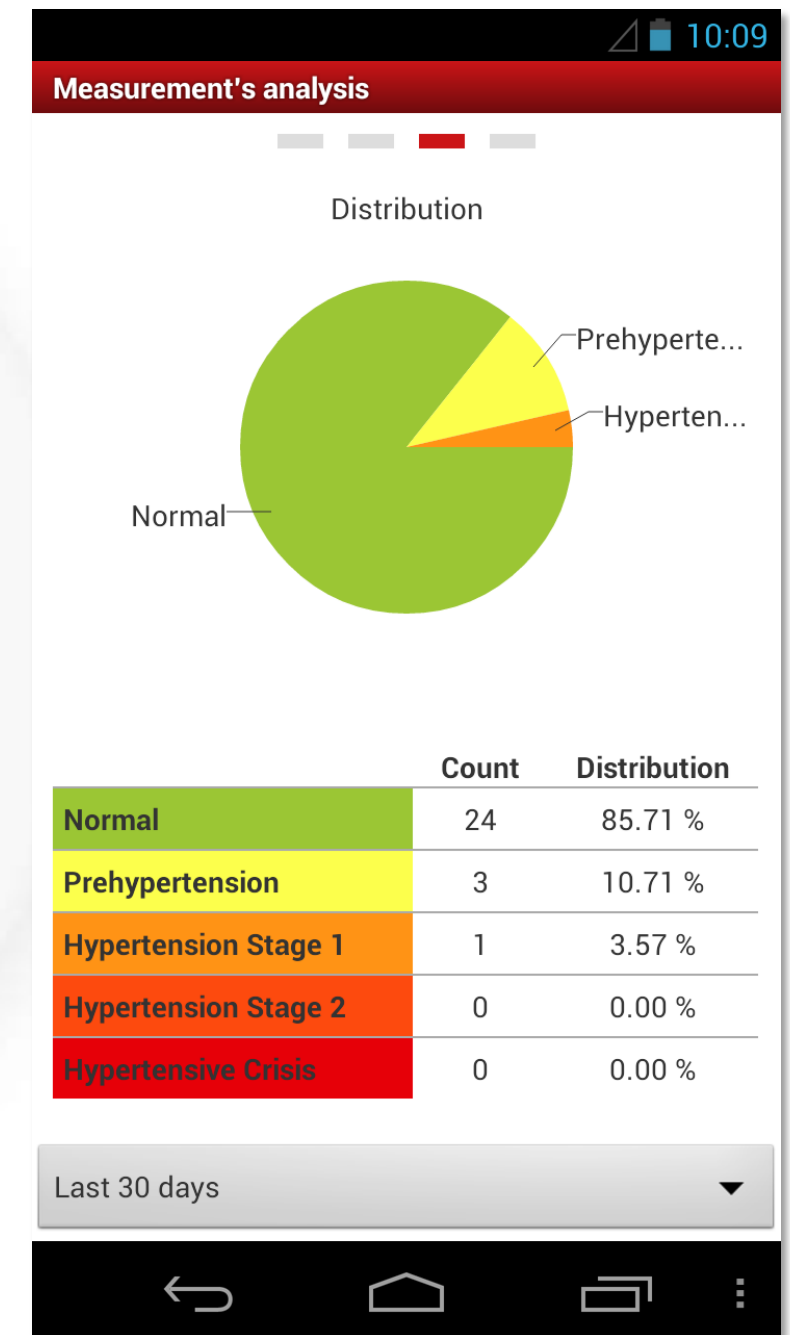
Last week

Current month

Last month

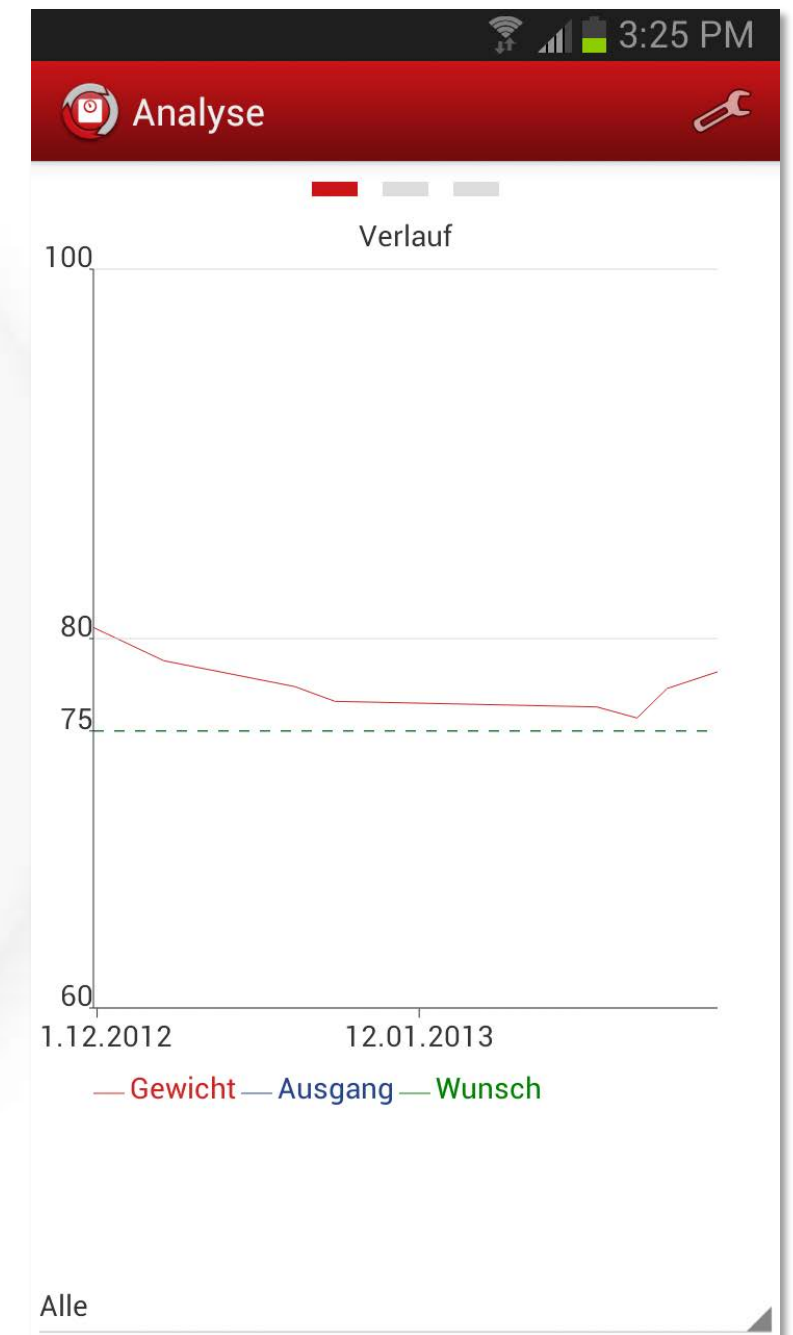
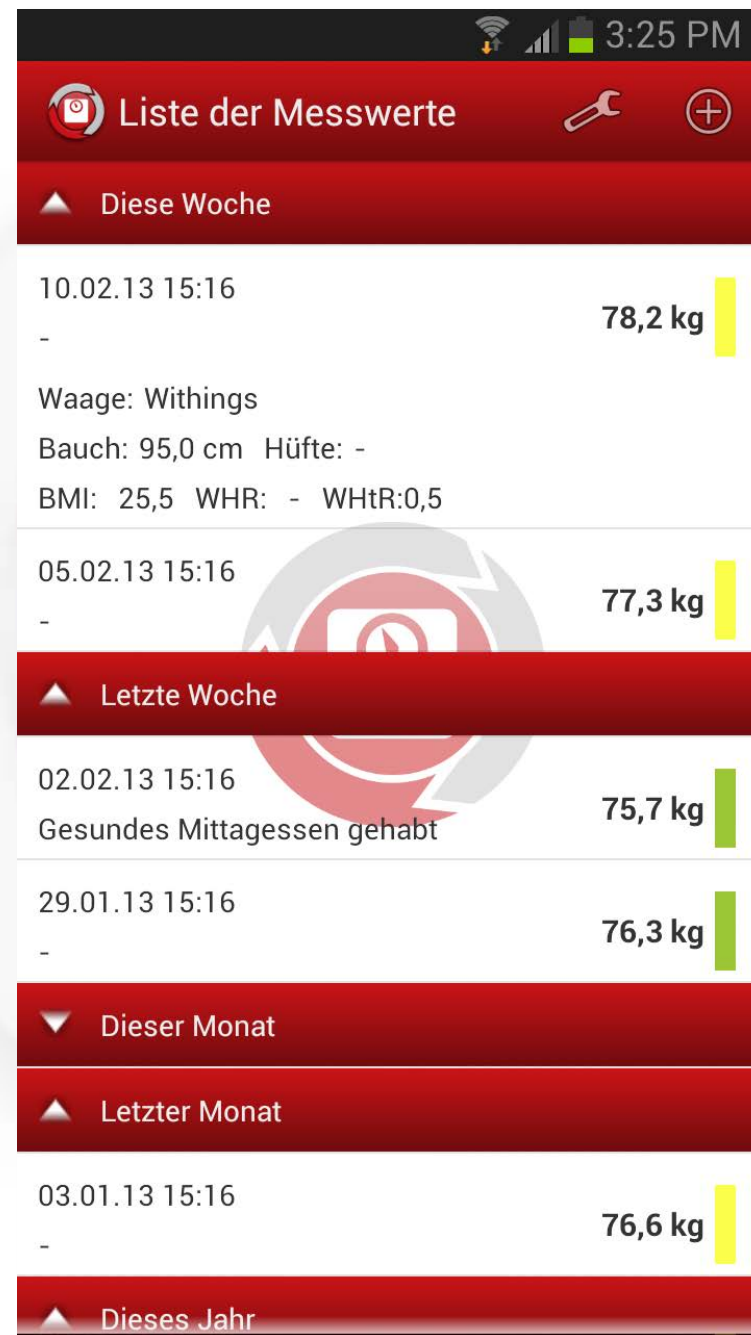
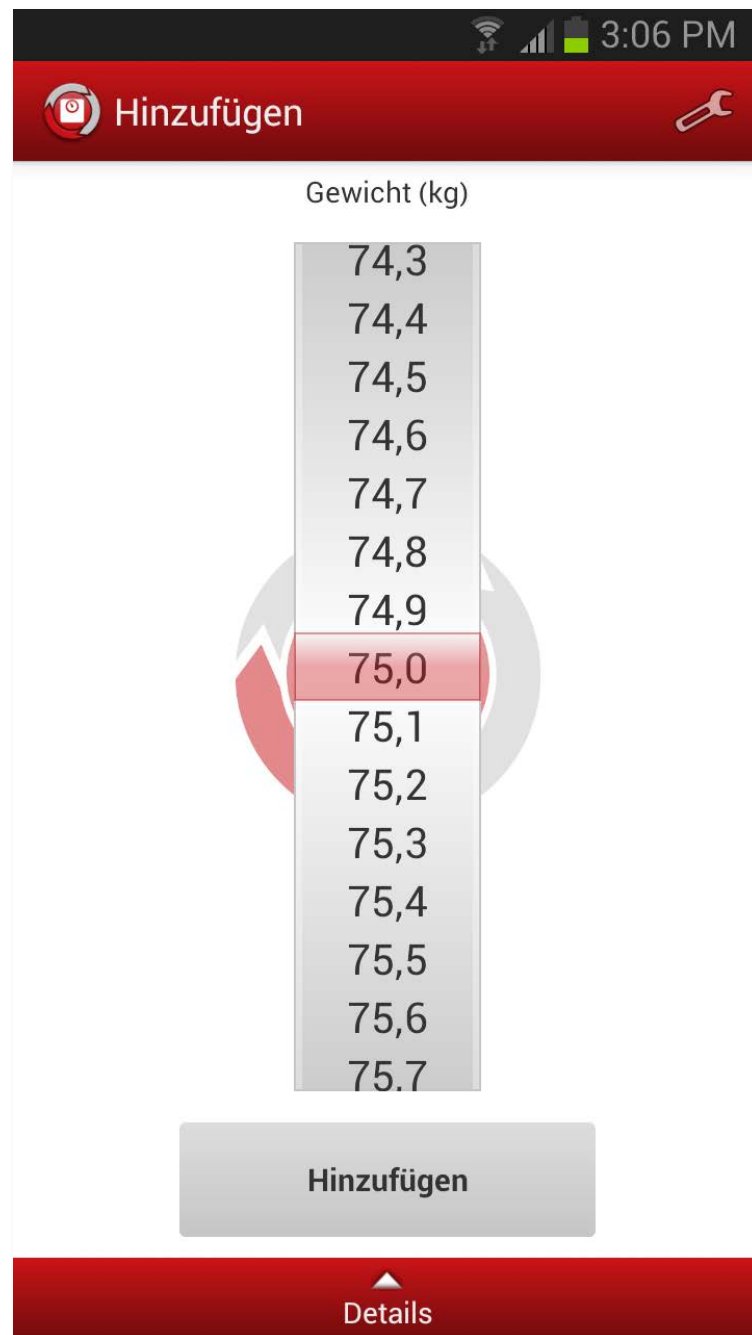
Current year

Add



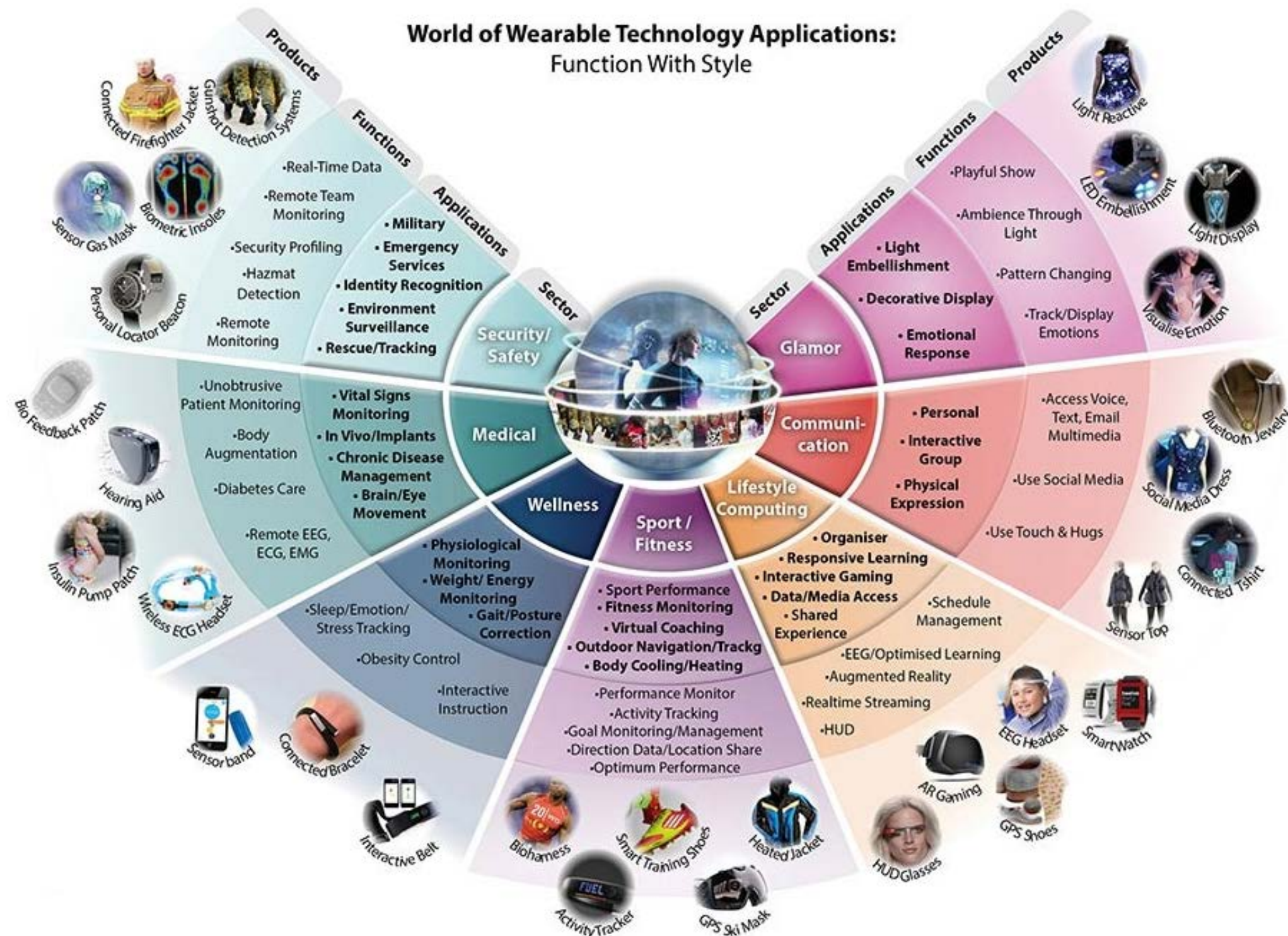


# Medando: *WeightCompanion*



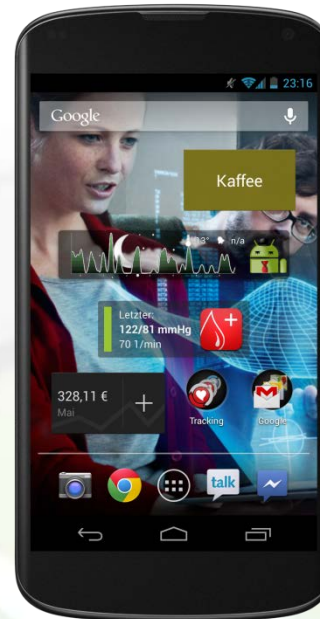


# Wearable Technology



Source: <http://www.beechamresearch.com/article.aspx?id=20>

# Many Devices, Sensors and Apps...



## Data Exchange: The Internet of Things





# Notification on Android



# Sharing



**Vitalwerte** @vitalwerte\_as

1 Dez

Meine Fitbit [#Fitstats\\_DE](#) für 11/30/2013: 6.816 Schritte und 5 km zurückgelegt. [fitbit.com/user/22X4YM](http://fitbit.com/user/22X4YM)

Öffnen

← Antworten ↻ Retweeten ★ Favorisieren ... Mehr



**Vitalwerte** @vitalwerte\_as

30 Nov

Mein [#Blutdruck](#): 125/83, Puls: 55. Aufgezeichnet mit der [@BlutdruckApp](#) für [#Android](#): [blutdruckbegleiter.de](http://blutdruckbegleiter.de) [#quantifiedself](#) [#mHealth](#)

Details anzeigen

← Antworten ↻ Retweeten ★ Favorisieren ... Mehr

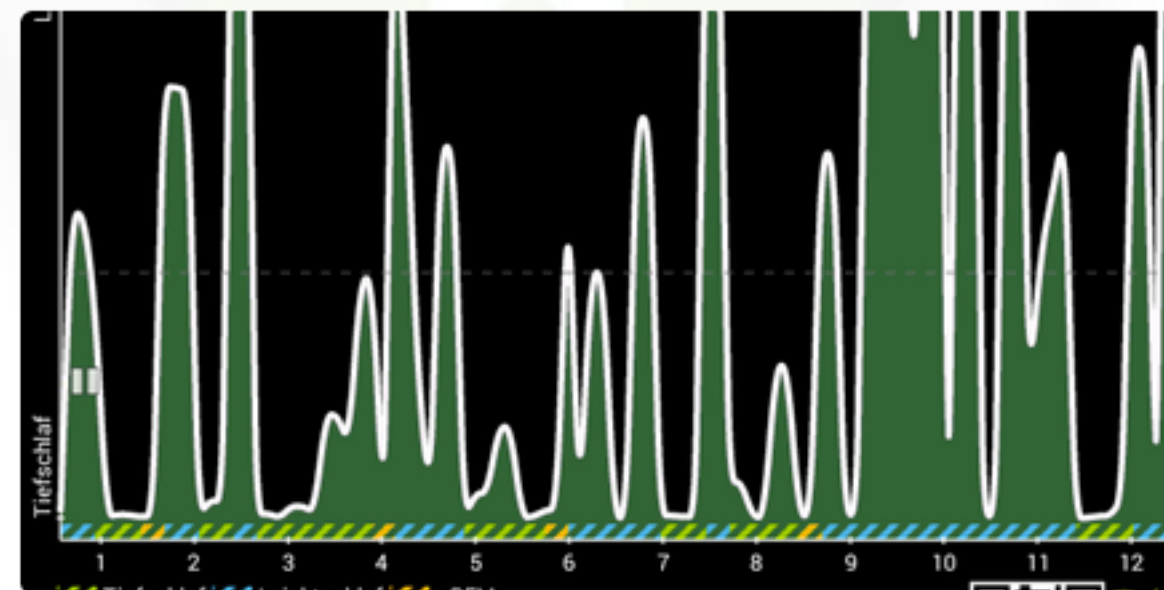


**Vitalwerte** @vitalwerte\_as

30 Nov

Sleep as Android: Schlaf 30.11. 0:34 → 12:38 (11:58) Tiefschlaf 48% [#Sleep\\_as\\_Android](#)

  
[pic.twitter.com/tdfqNP1hsV](http://pic.twitter.com/tdfqNP1hsV)



Öffnen

← Antworten ↻ Retweeten ★ Favorisieren ... Mehr



# Data Analytics

## Activity





# Steps (Fitbit)


## Activity

updated 19 mins ago

 **19792** steps taken

 **38** floors climbed  
You have climbed: The Tallest Sequoia ★

 **14.55** km traveled

 **3120** calories burned

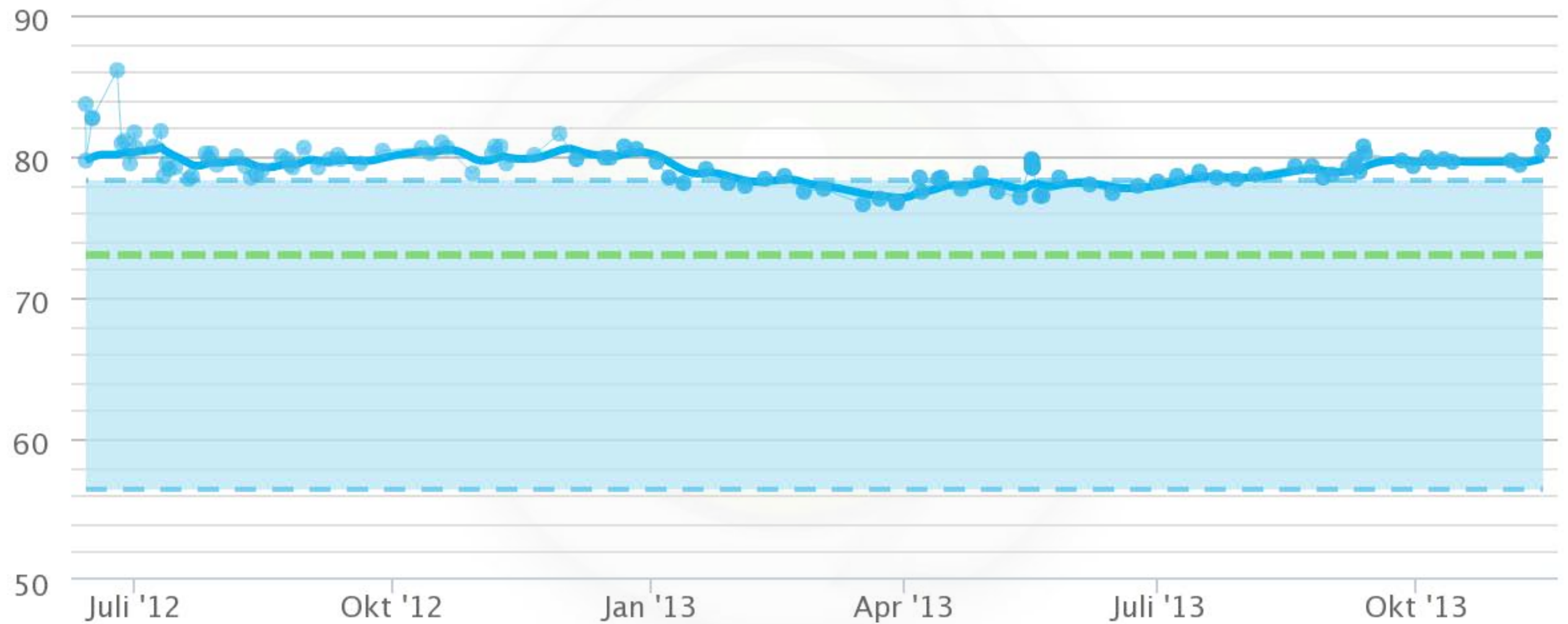
Top Daily Step Badge  
**15,000 steps**



Top Daily Climb Badge  
**25 floors**

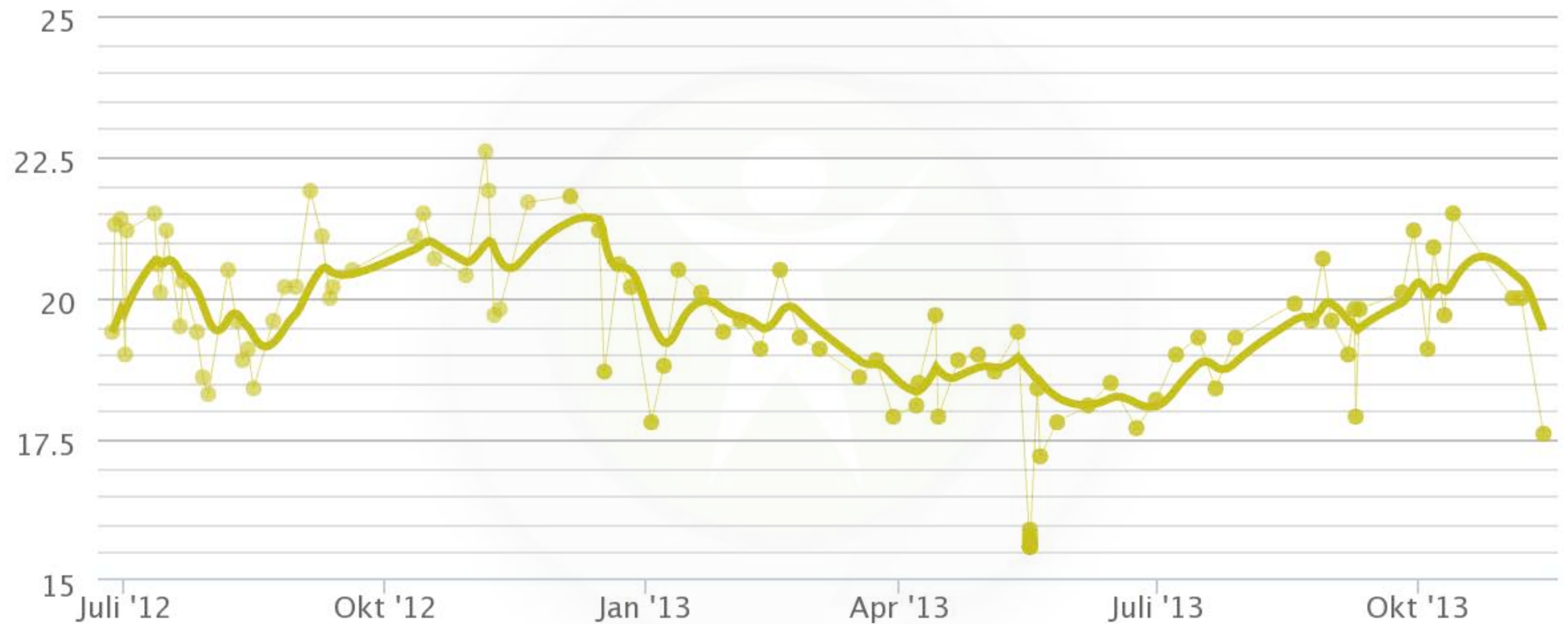


# Weight (Withings)





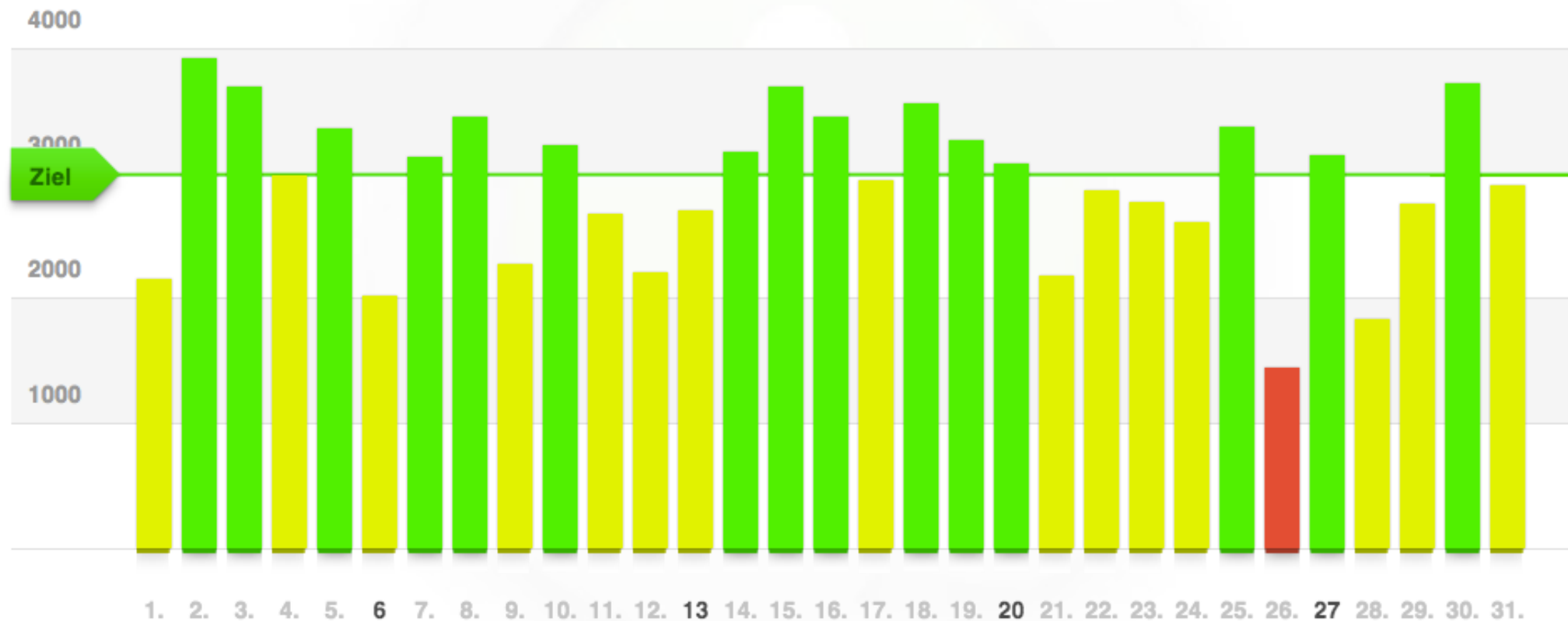
# Body Fat (Withings)



# Activity (Nike Fuelband)

**NIKEFUEL 90.913<sup>+</sup>**

Dein Monatsdurchschnitt ist 53.258<sup>+</sup>



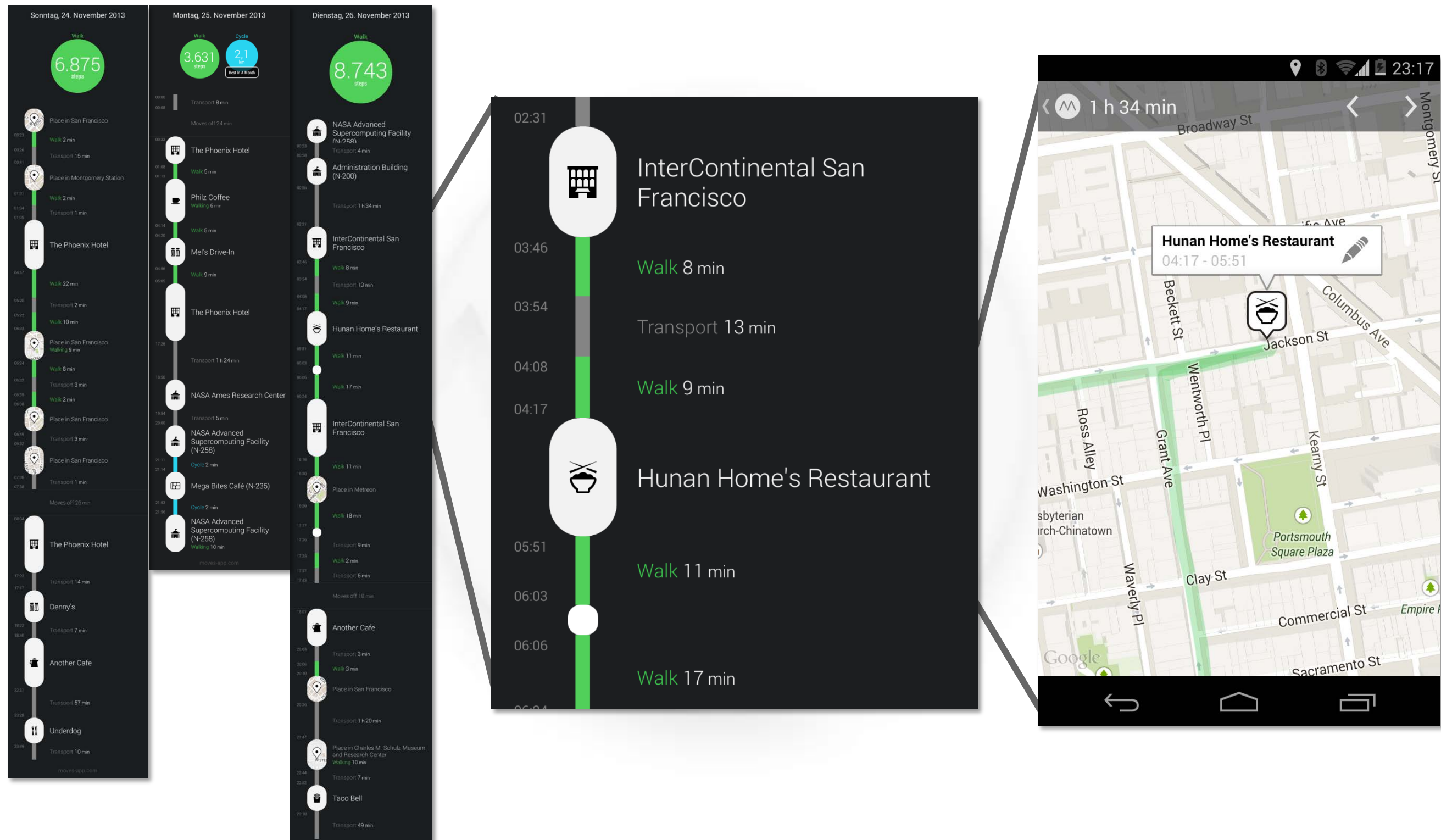
1.008  
Kalorien/Tag

11.279  
Schritte/Tag

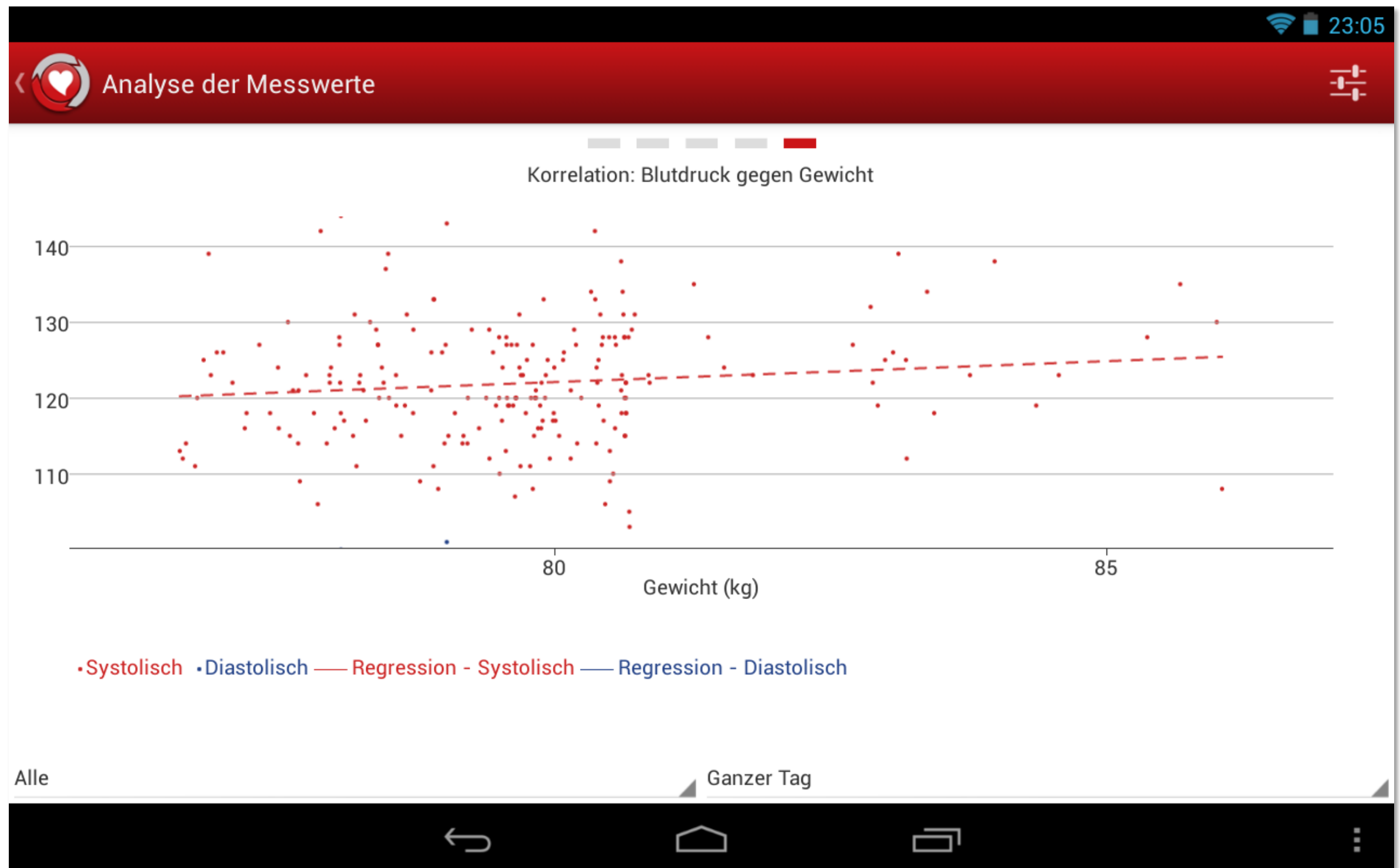
48%  
Tagesziele erreicht

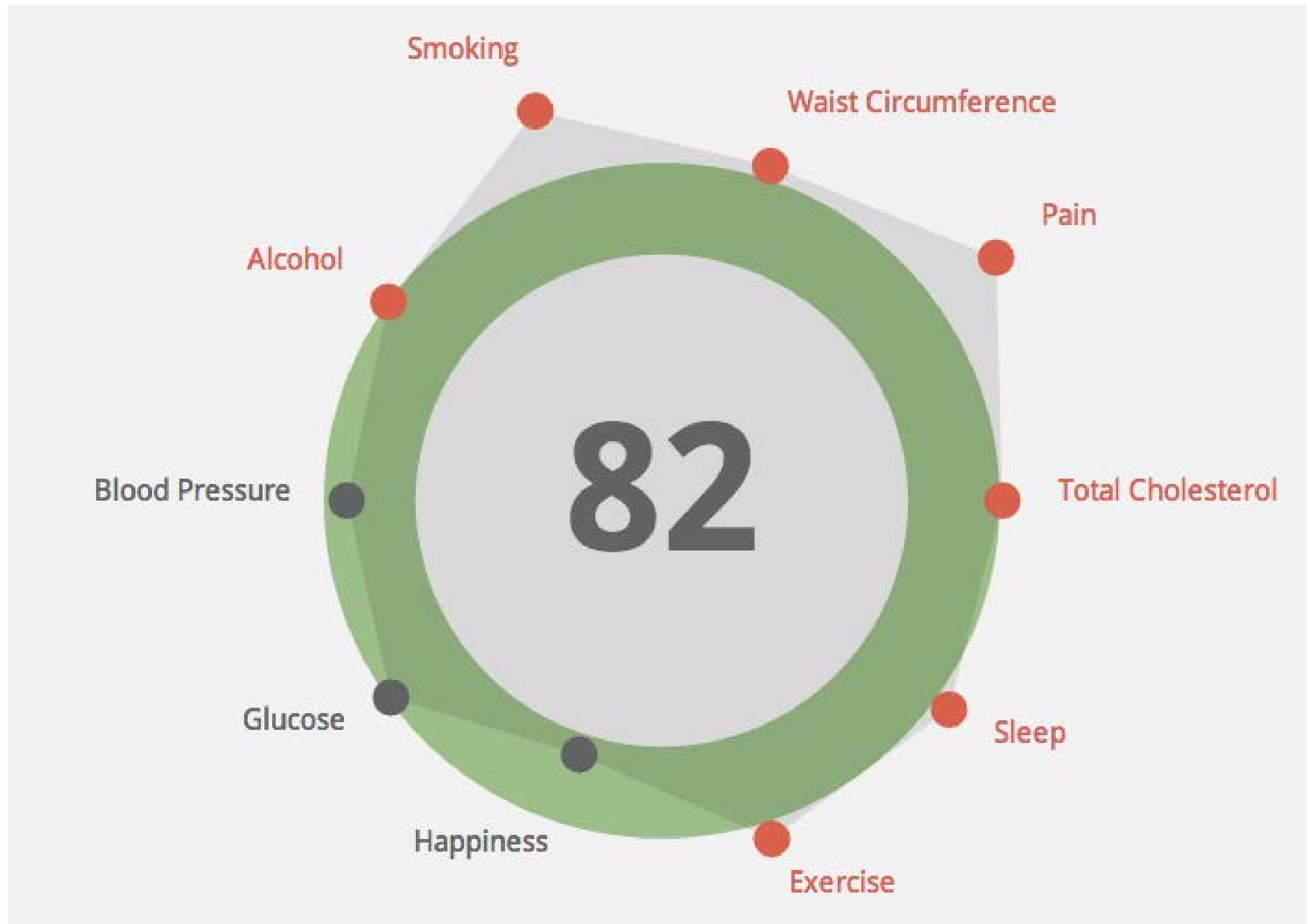
0  
Gewonnene  
Stunden/Tag

# Activity & Location (Moves)



# Blood Pressure vs. Weight





To be continued...

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# Big Data

# Conclusions

- Quantified Self community is growing
- Many more devices and apps
  - Mobile!
  - Wearable!
- Data analytics at the beginning







# Discussion

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